

**APPENDIX K**  
**HEALTH AND SAFETY**

## **ACRONYMS, ABBREVIATIONS, AND SYMBOLS**

<b>AAC/SEU</b>	Air Armament Center Range Safety Office
<b>AACI</b>	Air Armament Center Instruction
<b>AFB</b>	Air Force Base
<b>BASH</b>	Bird/Wildlife Aircraft Strike Hazard
<b>BDU</b>	Bomb Dummy Unit
<b>CBU</b>	Cluster Bomb Unit
<b>EOD</b>	Explosive Ordnance Disposal
<b>GBU</b>	Ground Bomb Unit
<b>JSF</b>	Joint Strike Fighter
<b>MACA</b>	Mid-Air Collision Avoidance
<b>MJU</b>	Munitions Countermeasures Unit
<b>RMB</b>	Risk Management Board
<b>ROCC</b>	Range Operations Control Center
<b>U.S.</b>	United States
<b>USDA</b>	U.S. Department of Agriculture

# HEALTH AND SAFETY

## FLIGHT OPERATIONS

### Aircraft Mishaps

There are well-established procedures for responding to aircraft mishaps on non-Air Force property. When normal, scheduled flying is in progress, Eglin Air Force Base (AFB) maintains highly trained emergency response teams, which are available to respond to aircraft crashes off-site. In addition, Eglin AFB maintains mutual aid agreements with local fire departments that detail each party's responsibility when responding to a mishap. The base also conducts regular aircraft mishap training exercises.

Additionally, the Mid-Air Collision Avoidance (MACA) program is designed to educate the local flying public on the military aircraft operations in the skies surrounding the installation. This program involves visiting local airports (i.e., Fort Walton Beach, Destin, and Crestview) at least once a year and providing an informational brochure on military flying activity, restricted airspaces, and so on. This brochure is provided to local and transient pilots, air traffic controllers, and ground crews and depicts local flight restrictions as well as primary arrival and departure routes and training areas for Eglin AFB, Hurlburt Field, and the most widely used local airports, Crestview and Destin (U.S. Air Force, 2001).

### Bird/Wildlife Aircraft Strike Hazard (BASH)

In the immediate vicinity of Eglin AFB, bird populations are controlled through aggressive habitat management procedures. Eglin AFB has contracted with U.S. Department of Agriculture (USDA) Wildlife Services to gather data concerning species composition and associated attractants. Additionally, the USDA makes recommendations to mitigate strike risks as well as to provide direct control of wildlife. When birds congregate, various bioacoustic and pyrotechnic dispersal techniques are employed to reduce the bird density, with physical means employed to remove any deer, coyote, and red fox from the airfield. If required, other control measures are detailed in the unit BASH plan. Additionally, the presence of birds and the size and density of flocks are monitored by USDA Wildlife Services, aircrew using Eglin AFB, and airfield management personnel. As the presence of birds increases, thereby creating an elevated safety risk, flight operations may be limited, modified, or even completely curtailed until the risk is reduced (U.S. Air Force, 2007).

### Explosives Safety

Aircraft-delivered ordnance (e.g., GBUs [ground bomb units]) would require generation/implementation of weapons safety footprints to define personnel

evacuation areas during training activities. On the aircraft, there are several electromechanical safeguards specifically designed to prevent the accidental, inadvertent, or uncommanded release of ordnance. Because the aircraft's bombing system is a man-made, electromechanical system, it is impossible to state categorically that an accidental release of ordnance could never occur; however, safety risk analyses show that the risk of accidental releases that could have serious consequences is so small that it can be essentially discounted (Air Combat Command, 1999). There is the potential for a commanded release to be ineffective, resulting in "hung" ordnance. In such an event, Joint Strike Fighter (JSF) personnel would act in accordance with Air Armament Center Instruction (AACI) 11-201, Sections 9.12 through 9.15 and the corresponding attachments 36 to 40, summarized below.

During development of the safety annex to the test directive, the Air Armament Center Range Safety Office (AAC/SEU) assigns an appropriate category number (I through VI) to munitions (ordnance)/external stores as outlined in Table K-1. The assigned category is then reviewed by the Risk Management Board (RMB), and any disagreements are resolved by coordination between the RMB and AAC/SEU. The munitions category is used to determine the correct takeoff runway and the decision tree/crash response to be used for landing with hung unexpended ordnance. The type of ordnance and number loaded on the aircraft must be reported during aircraft emergencies.

**Table K-1. Munitions (Ordnance)/External Stores Categories**

Category	Definition
I	All live ordnance containing primary explosive such as: - Rockets and missiles with live motors - Live bombs regardless of type of fuse - Live CBU munitions - LUU-series flare/ground markers
II	Ordnance with initiating explosive only, or with an incomplete explosive, such as: - Inert bombs with live fuses or boosters - Inert CBU munitions with live detonators - MJU-2/7/10 flares, RR-170/180 chaff
III	Jettisonable nonexplosives such as: - Inert munitions - Training shapes - Instrumentation or pods (fuel tanks are excluded) - All confirmed empty dispensers
IV	BDU-33, MK-106, or similar training ordnance.
V	Any gun loaded with live rounds of any type.
VI	Nonjettisonable, nonexplosive stores that have the appearance of ordnance. These stores are completely inert and secured to aircraft with no method of release, such as pods, training shapes, training missiles, and baggage pods.

Source: AACI 11-201, 2006

BDU = Bomb Dummy Unit; CBU = Cluster Bomb Unit; MJU = Munitions Countermeasures Unit

Student pilots and instructors are briefed prior to any mission involving live ordnance, including specific hung ordnance procedures, to include recovery routes. Pilots reattempt ordnance release only as long as they remain in the bounds of the applicable test directive. Pilots notify the Supervisor of Flying and Eglin Mission Control as soon as possible to coordinate recovery, and pilots of aircraft with hung Category I munitions or unsecured Category II through IV declare an emergency. The Supervisor of Flying coordinates closing the appropriate roads with the tower and security forces personnel are dispatched to appropriate locations. Roads are closed prior to aircraft landing and remain closed until reopened by the emergency on-scene commander.

As previously indicated, pilots follow the specific procedures applicable to the type of hung ordnance their aircraft is carrying. Whenever possible, pilots with hung ordnance fly a straight-in approach to Eglin Main Base, avoiding populated areas. Fire department, weapons, and Explosive Ordnance Disposal (EOD) teams "safe" the munitions and determine status. AACI 11-201, Section 9.12.10.9, outlines specific procedures if a hung ordnance recovery is required at Duke Field.

Pilots are required to notify Eglin Mission Control at least 5 minutes prior to departing the test area, if possible, including ordnance category, type and number, and whether it is hung or unexpended. Eglin Mission Control ensures aircraft are provided a clear route, and advises Eglin Approach Control and the tower of the situation. Eglin Mission Control also notifies Range Operations Control Center (ROCC) and requests personnel for de-arming. ROCC notifies the appropriate Maintenance Operations Center who informs crash rescue, via the hot line, of the specific type and location of ordnance that is loaded on the aircraft. Crash rescue responds according to Table K-2.

**Table K-2. In-Flight Emergency Crash Rescue Response**

Category	Hung	Unexpended
I	Emergency	Advisory
II, III	Advisory	Advisory
IV, V, VI	No response	No response

After receiving permission from the tower to enter the runway, EOD personnel inspect the runway. After clearing the runway, aircraft bearing munitions items taxi to the appropriate de-arm area to have safety pins/devices installed prior to taxiing near other aircraft. EOD personnel inspect hung ordnance in the de-arm area and determine if the aircraft can proceed to the parking area, proceed to the hot gun area, or if it must be shut down. If the aircraft must be shut down, EOD personnel safe the hung ordnance and have the arm/de-arm crew pin all remaining munitions. EOD personnel take other necessary emergency actions as required. After the ordnance is safe, EOD and de-arm crews notify the pilot of action taken to safe hung/unexpended ordnance.

1 Current Eglin flying operations maintain these precautionary procedures for all takeoffs  
2 and landings of aircraft with ordnance. Live munitions have been carried and released  
3 on Eglin ranges for many years by pilots of all experience levels. AACI 11-201, Chapter  
4 9, details the extensive live ordnance procedures that these pilots have employed for  
5 takeoffs, landings, and hung weapons. Every JSF student sortie with planned ordnance  
6 release would fly in formation with an instructor who would direct the student's  
7 actions and be responsible for the safe conduct of the mission. The F-35 is unique and  
8 would normally carry ordnance in its internal weapons bays. If ordnance does not  
9 release properly (resulting in hung ordnance), the standard procedure would be to close  
10 the doors and return to base. AACI 11-201, Section 9.12.6, states, "Aircraft with closed  
11 bomb bay doors...are not categorized as 'hung ordnance.' However, de-arm personnel  
12 must be notified." JSF pilots would operate in accordance with established procedures  
13 to the extent possible, but because this aircraft is a new platform, safety procedures may  
14 be modified to provide the highest level of safety specifically for this aircraft.

## 15 REFERENCES

- 16 Air Combat Command, 1999. Renewal of the Nellis Air Force Range Land Withdrawal,  
17 Legislative Environmental Impact Statement. Air Combat Command (ACC).  
18 United States Air Force. March 1999.
- 19 U.S. Air Force, 2001. Fort Walton Beach, Destin and Crestview Area Mid-Air Collision  
20 Avoidance (MACA) Program. Airfield Operations Flight Commander, 46<sup>th</sup>  
21 Operations Support Squadron (AFMC). December 2001.
- 22 U.S. Air Force, 2007. BASH Statistics. Air Force Safety Center. Accessed at  
23 <http://www.afsc.af.mil/organizations/bash/statistics.asp> on 18 July 2009.